

FIG. 1

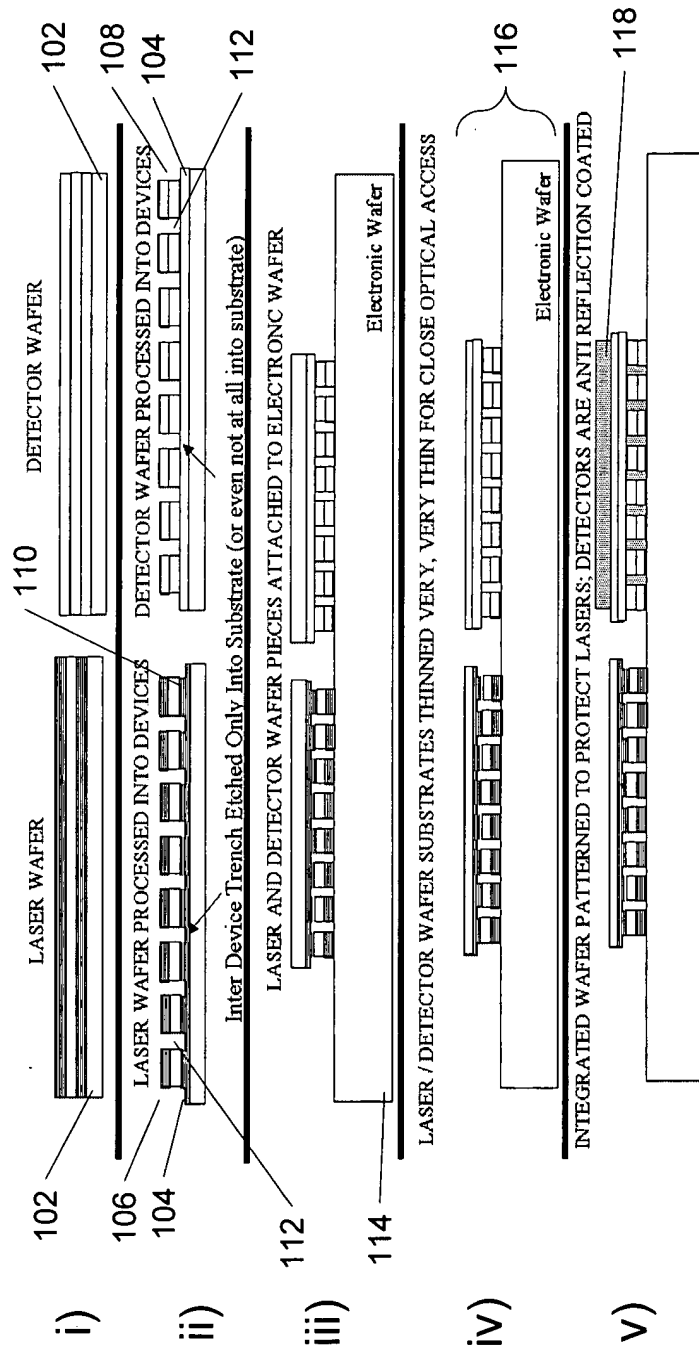


FIG. 1

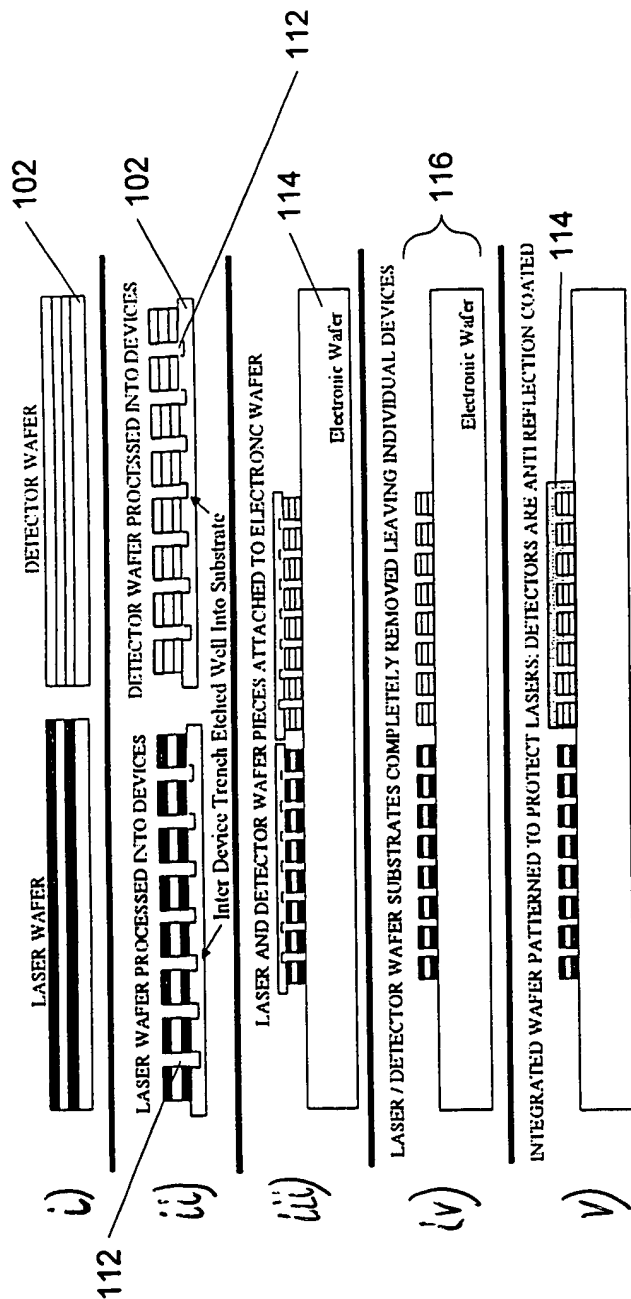


FIG. 2

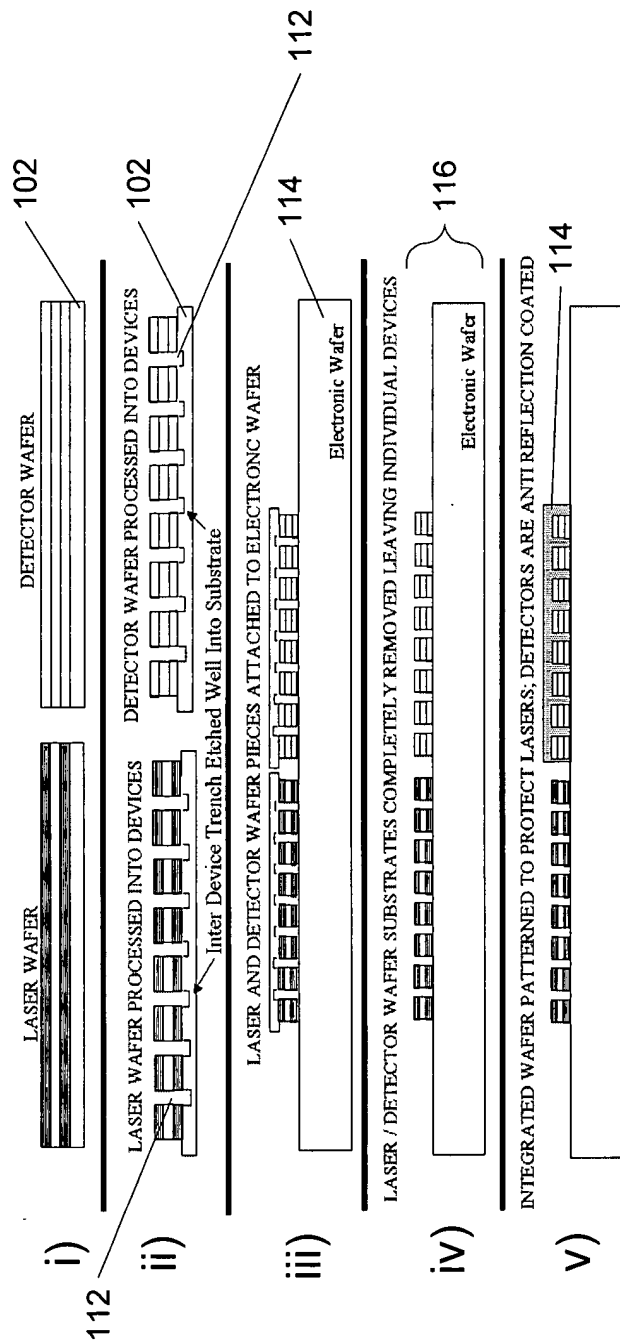


FIG. 2

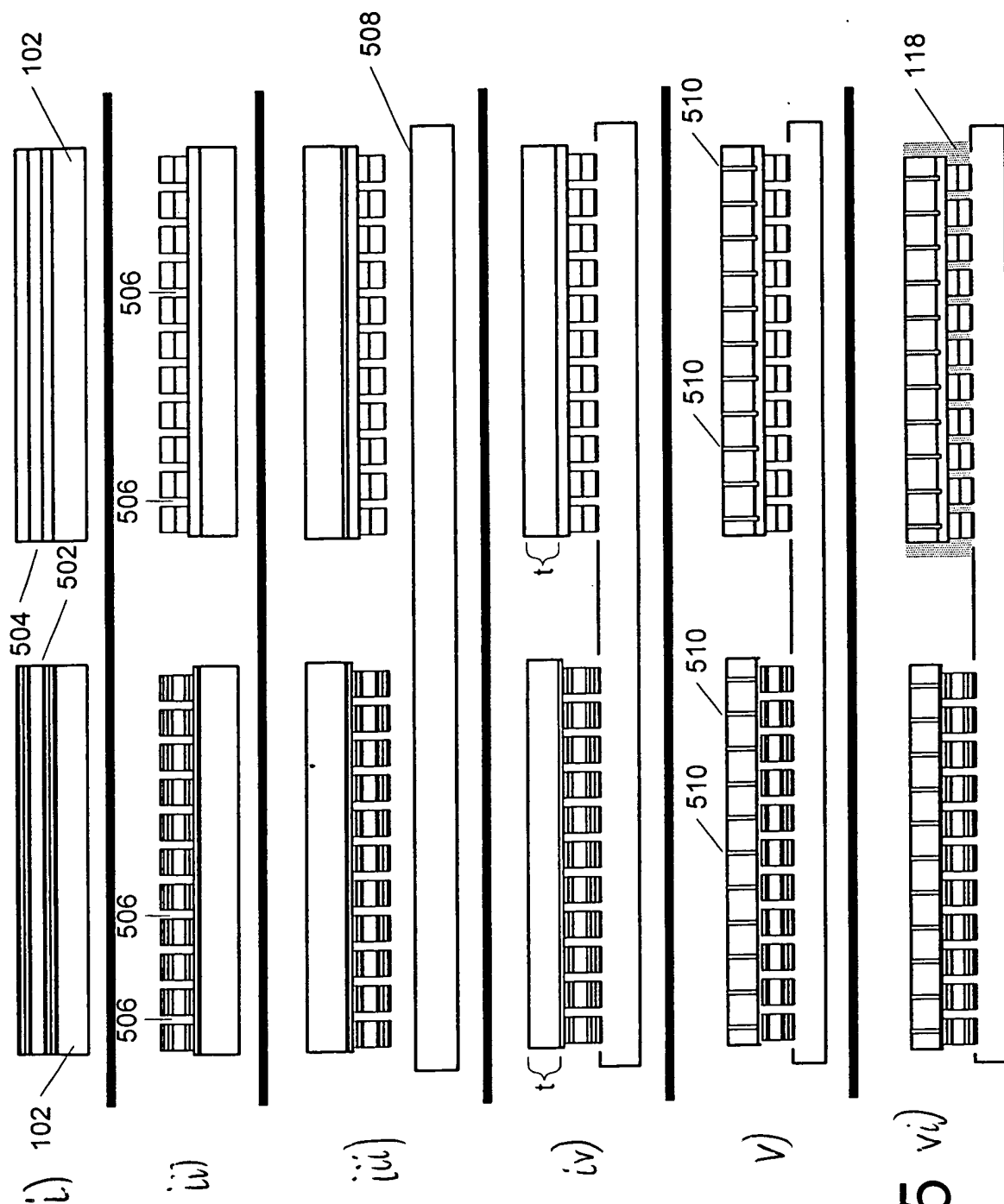


FIG. 5 vi)

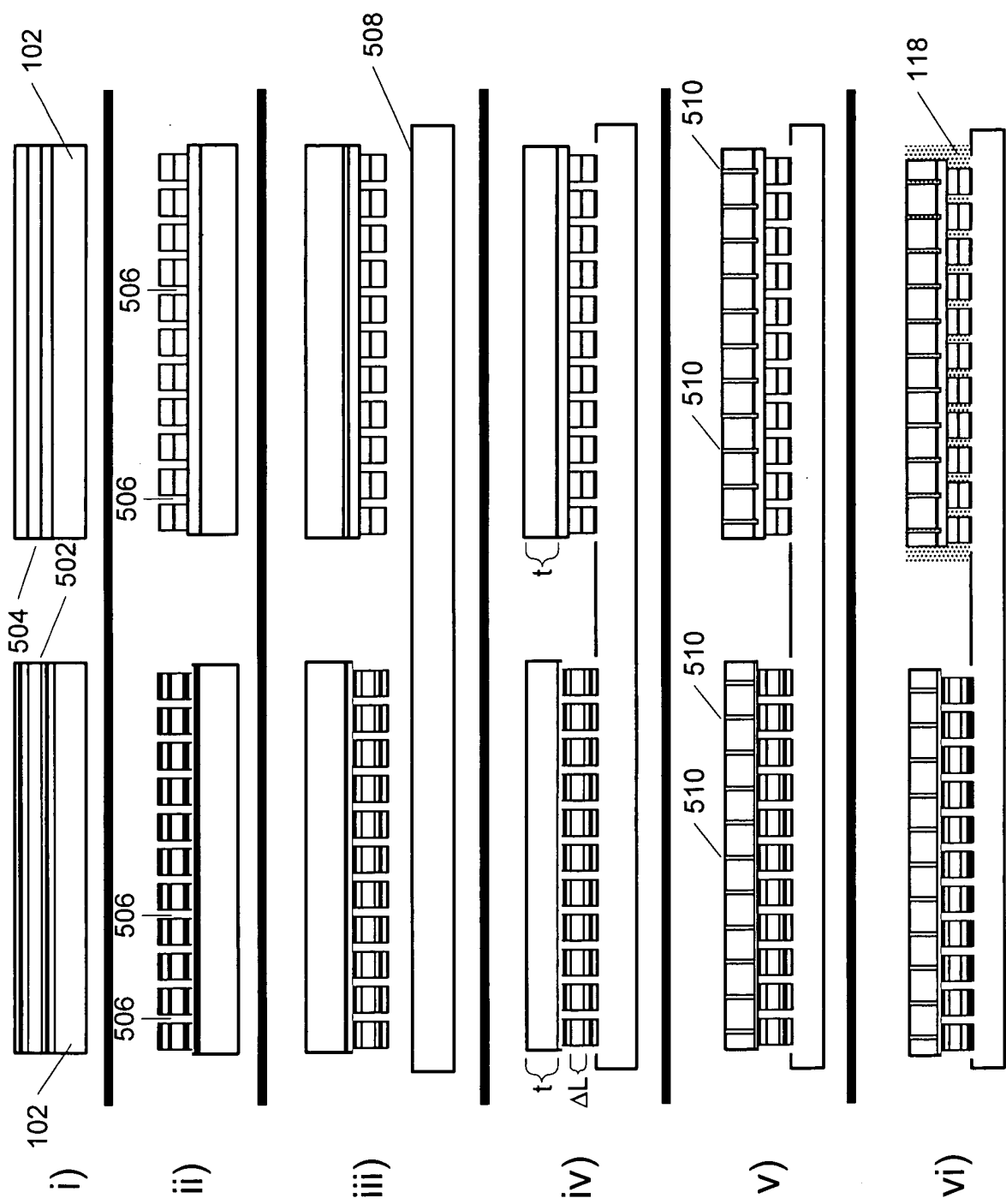
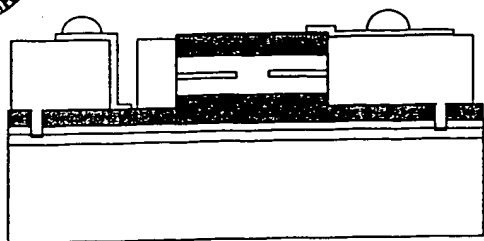
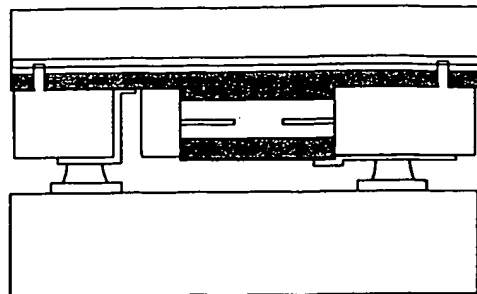


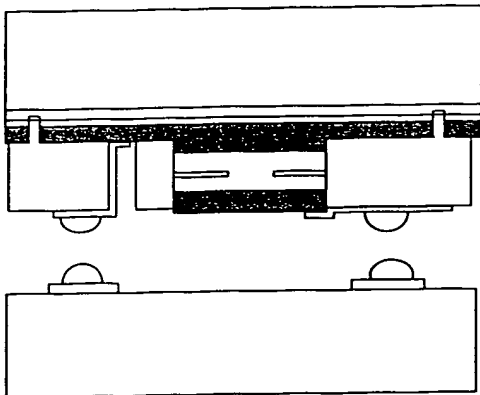
FIG. 5



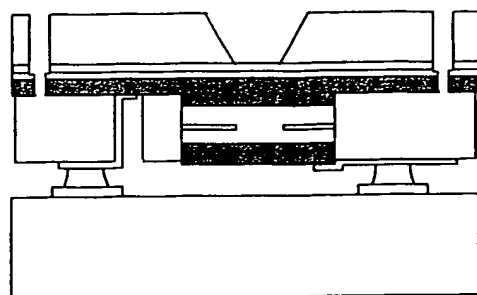
a)



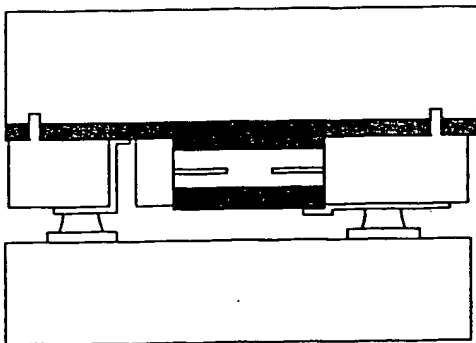
d)



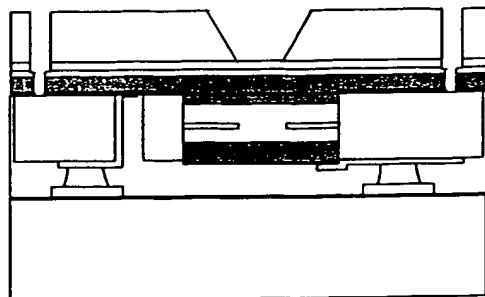
b)



e)

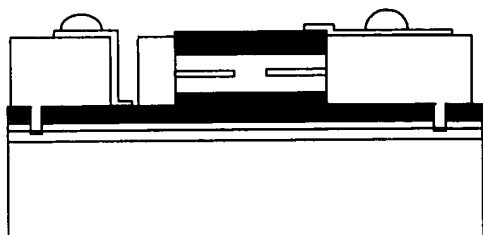


c)

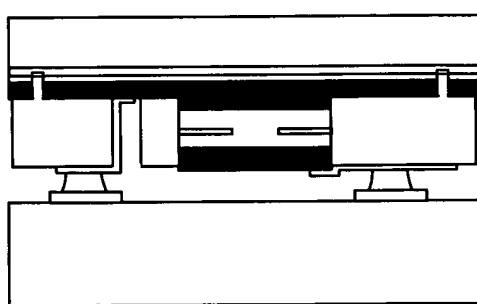


f)

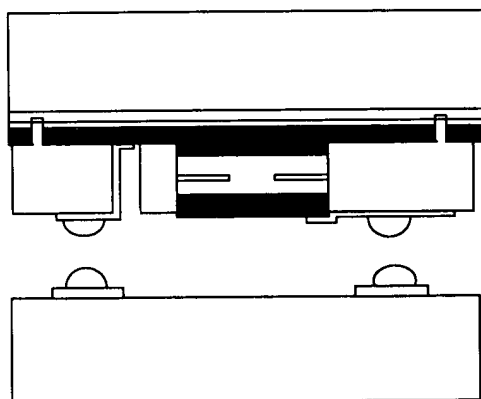
FIG. 12



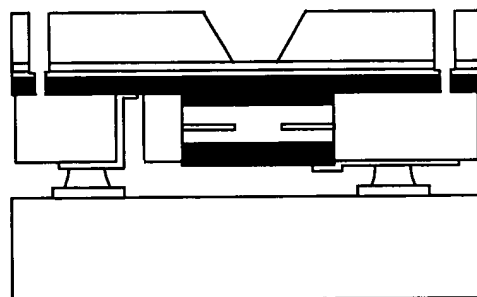
a)



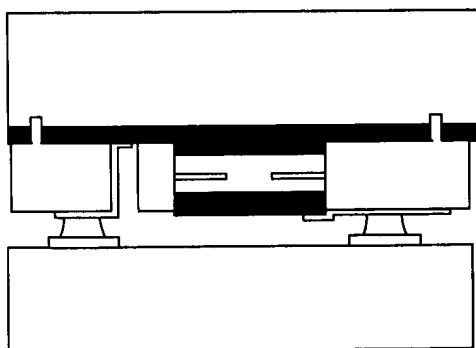
d)



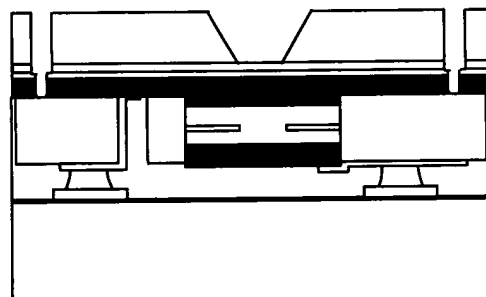
b)



e)



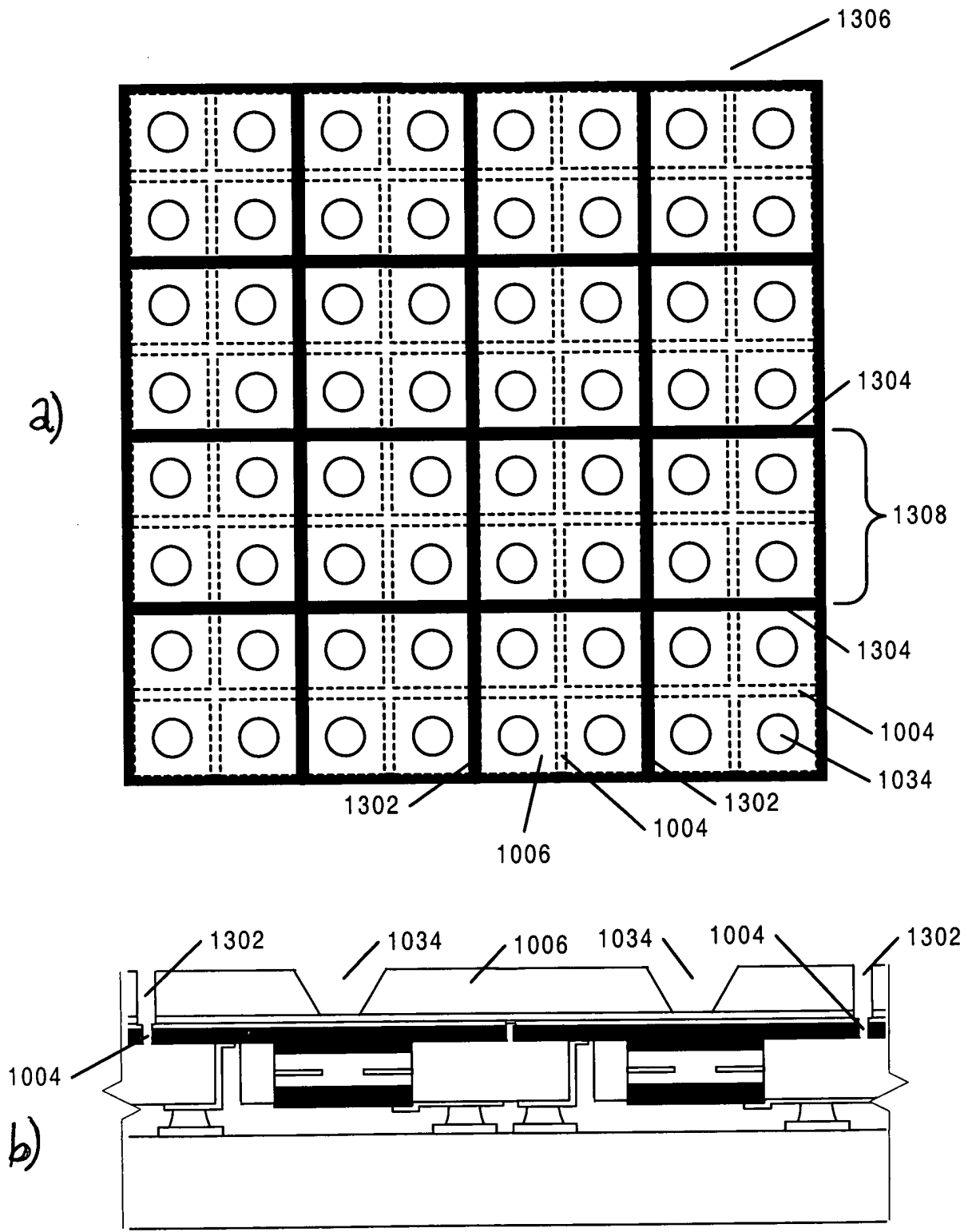
c)



f)

FIG. 12





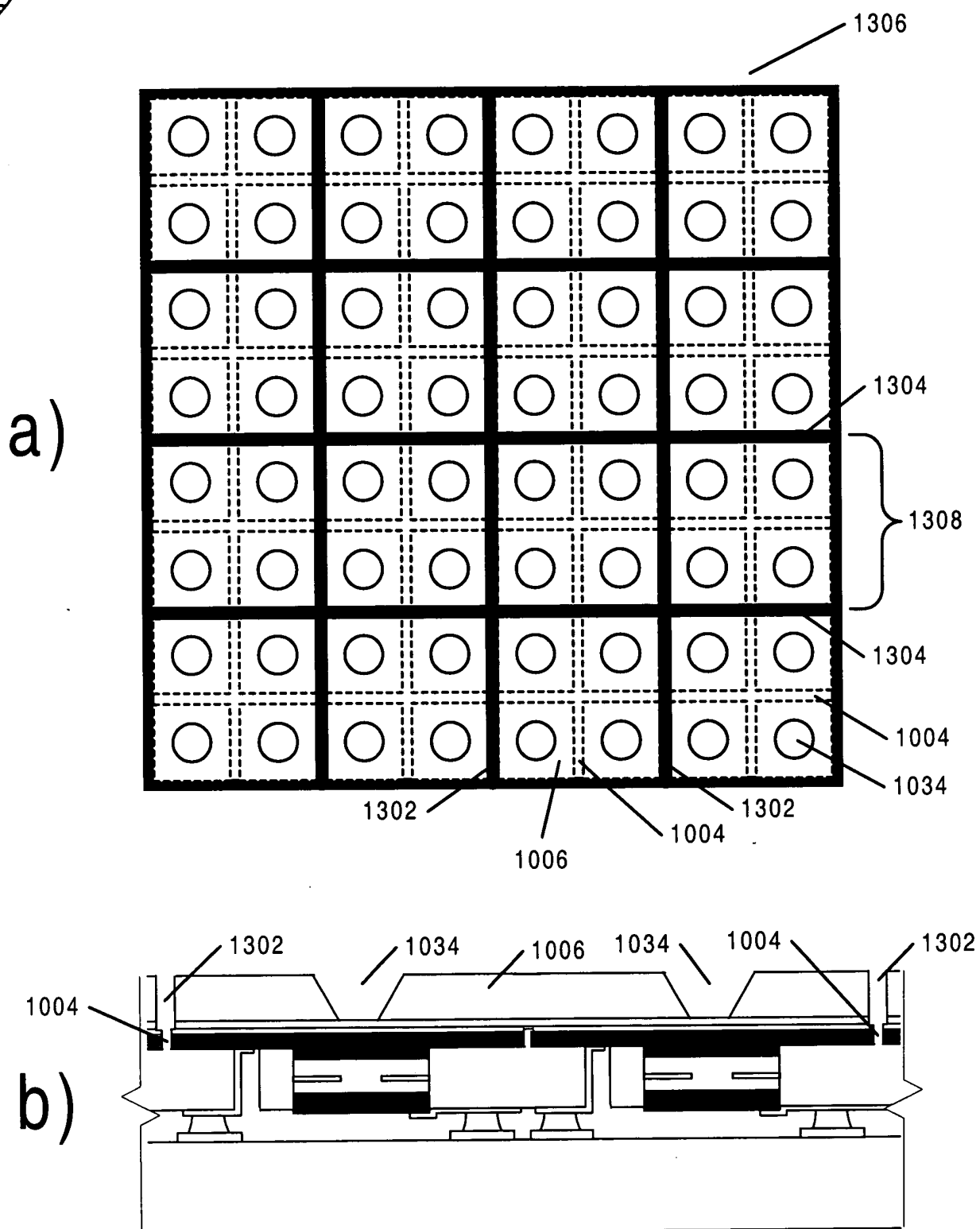
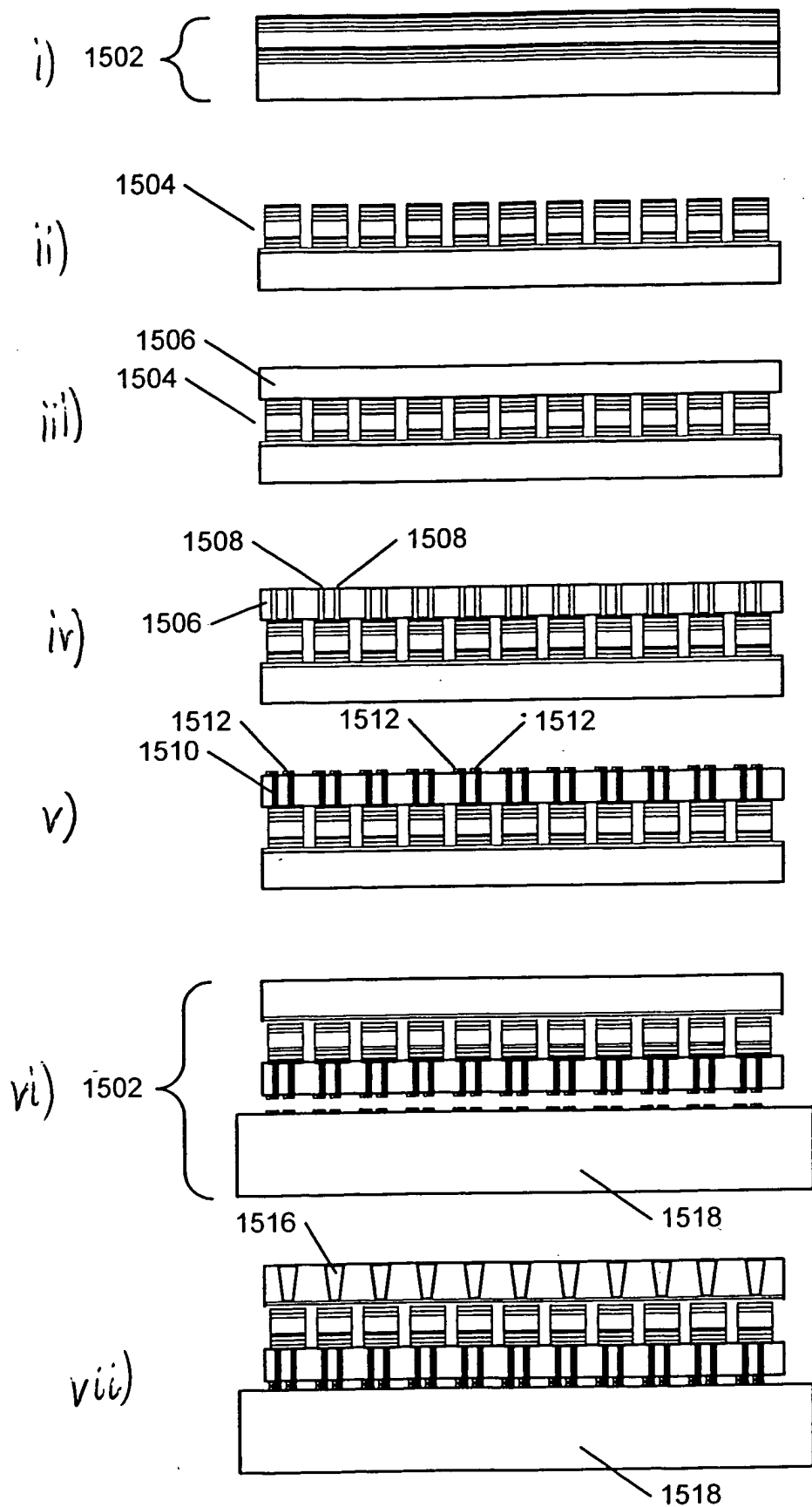


FIG. 15



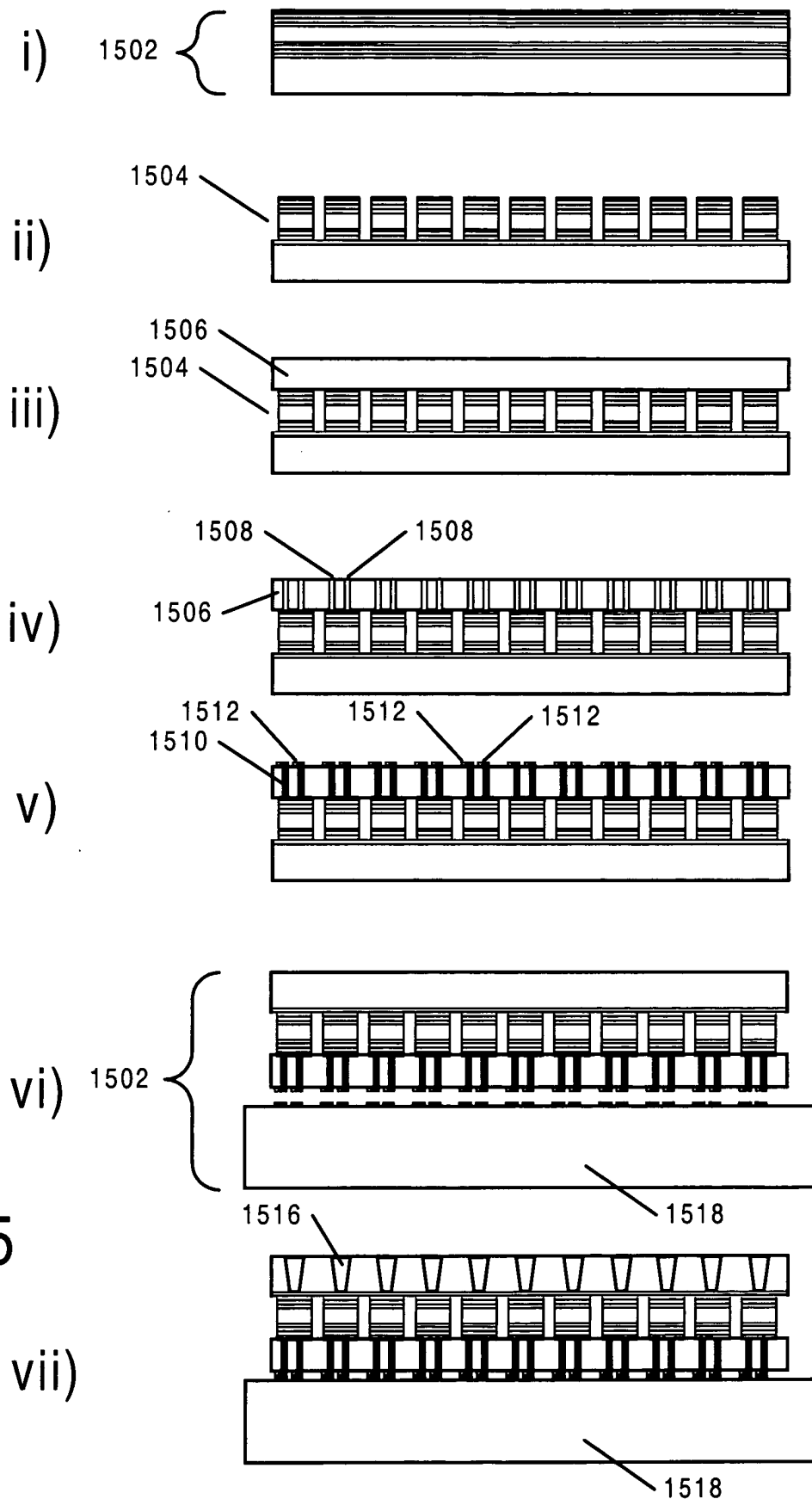


FIG. 15

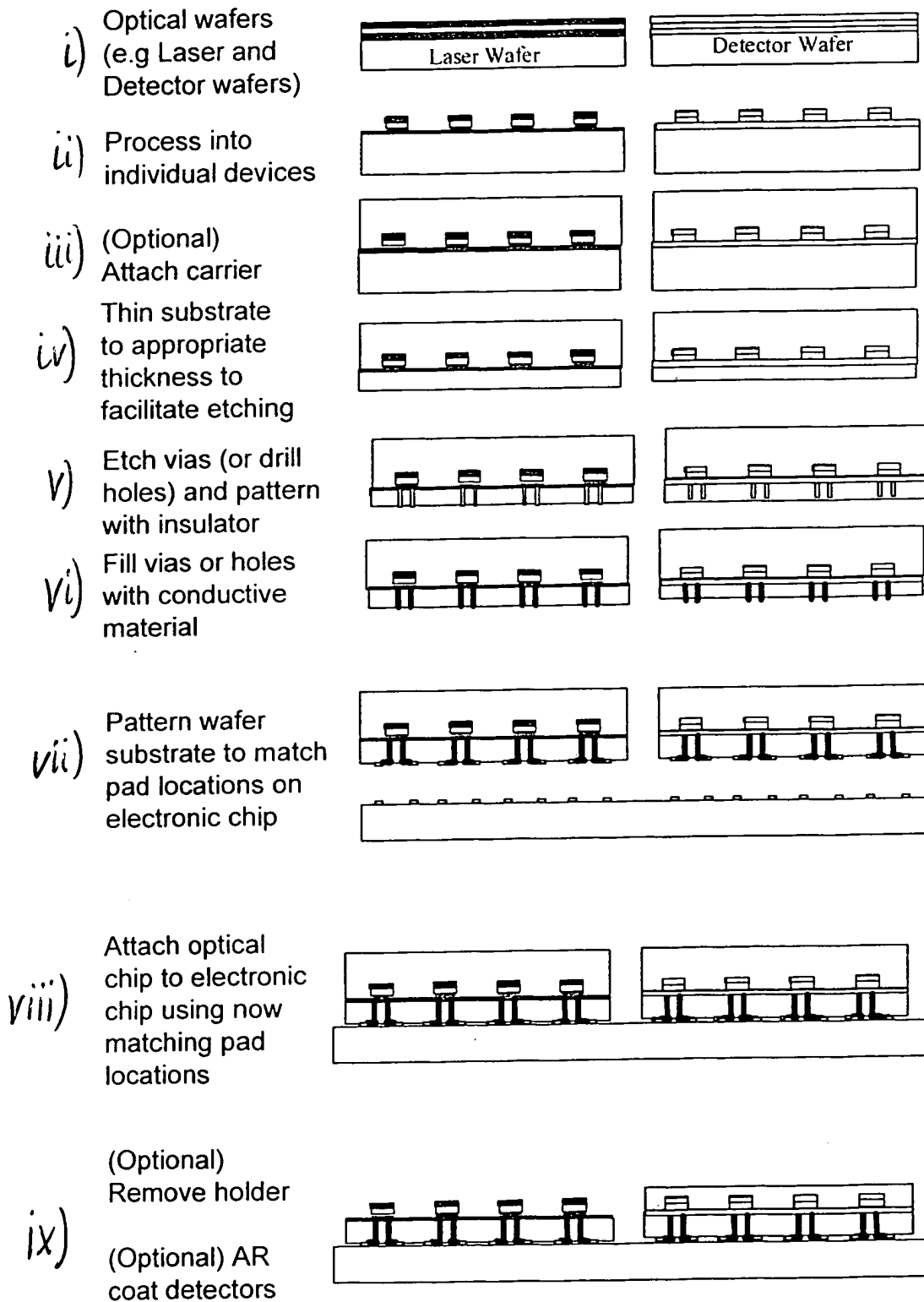


FIG. 16A

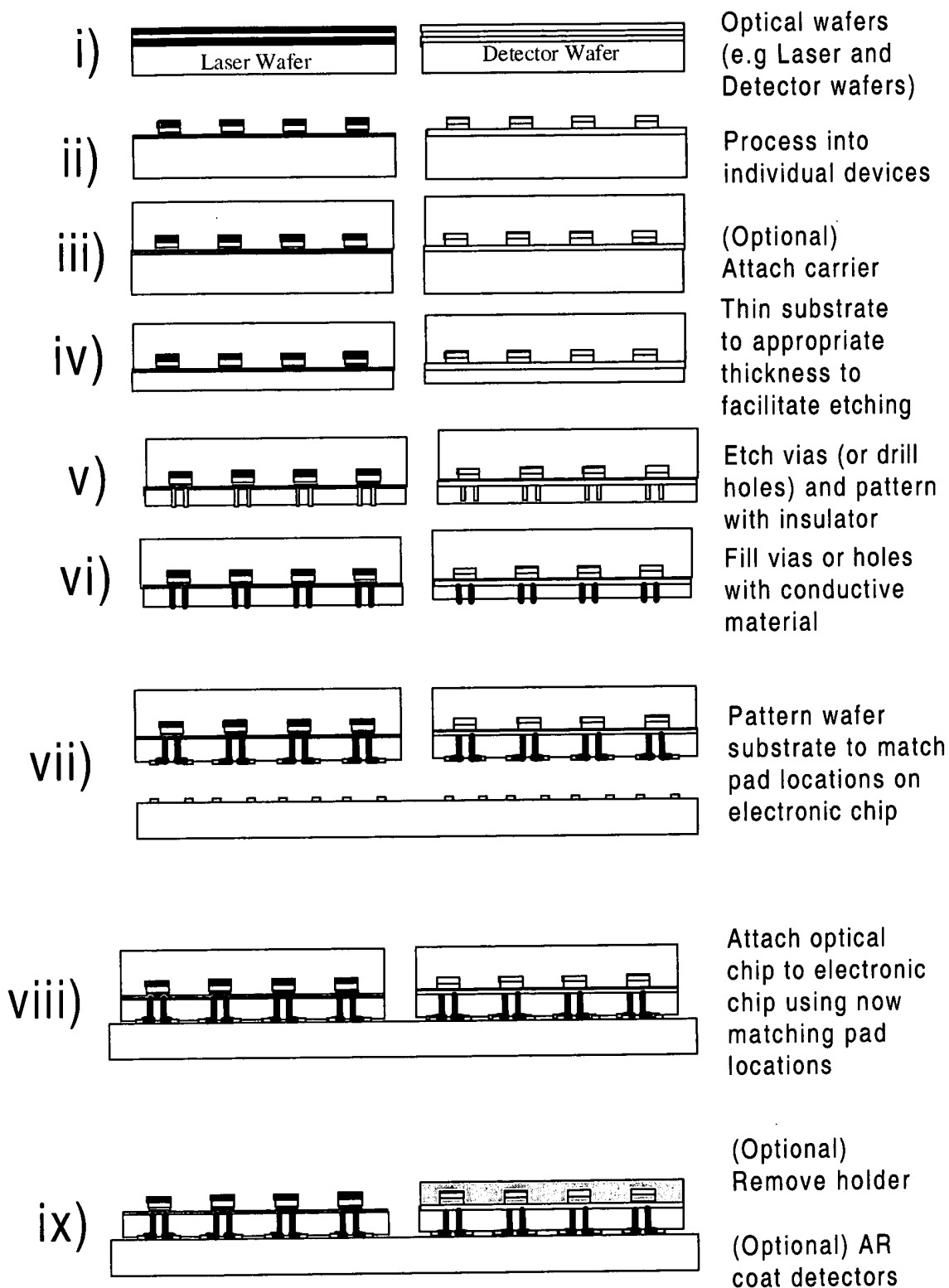


FIG. 16A

FIG. 16B

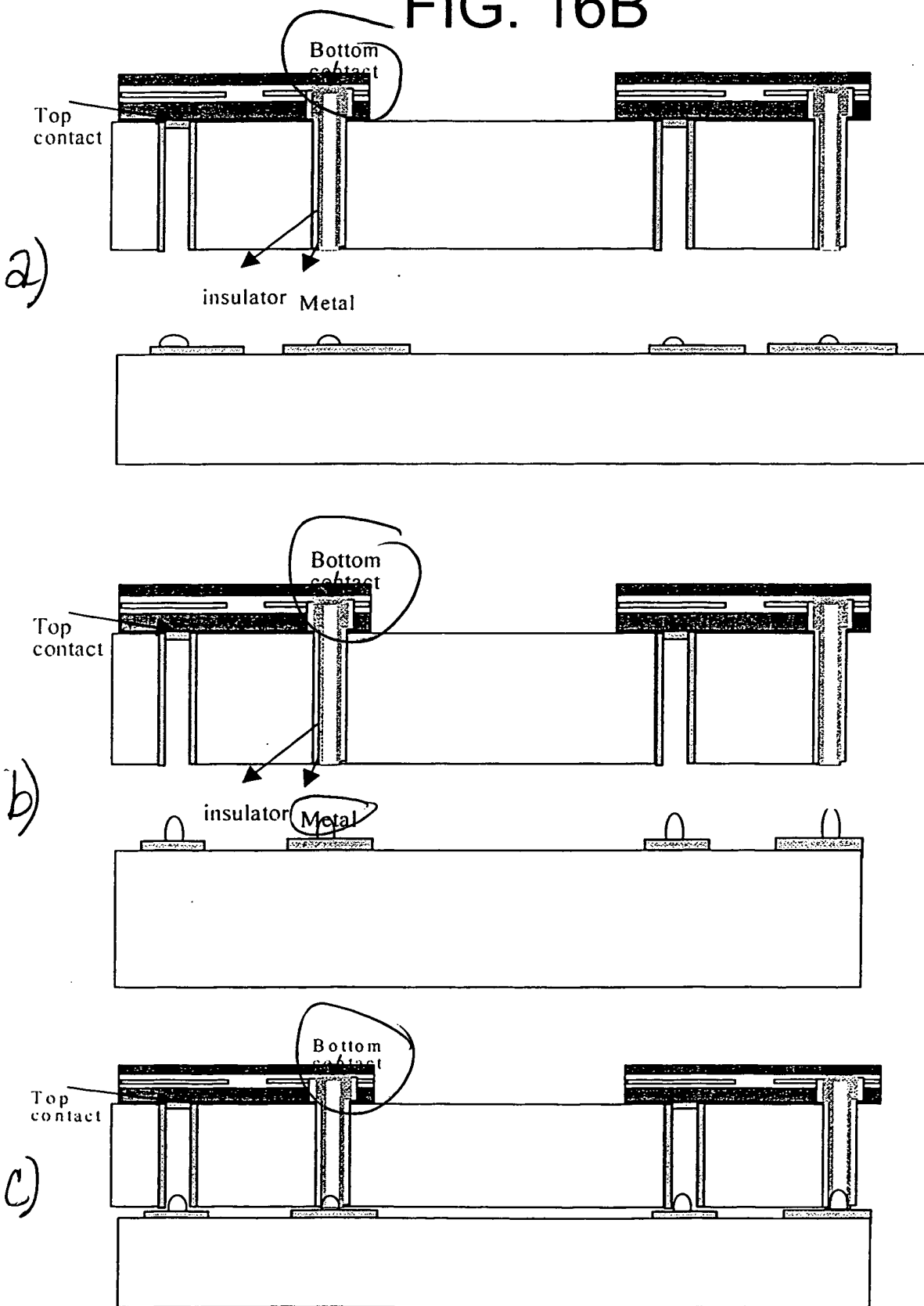


FIG. 16B

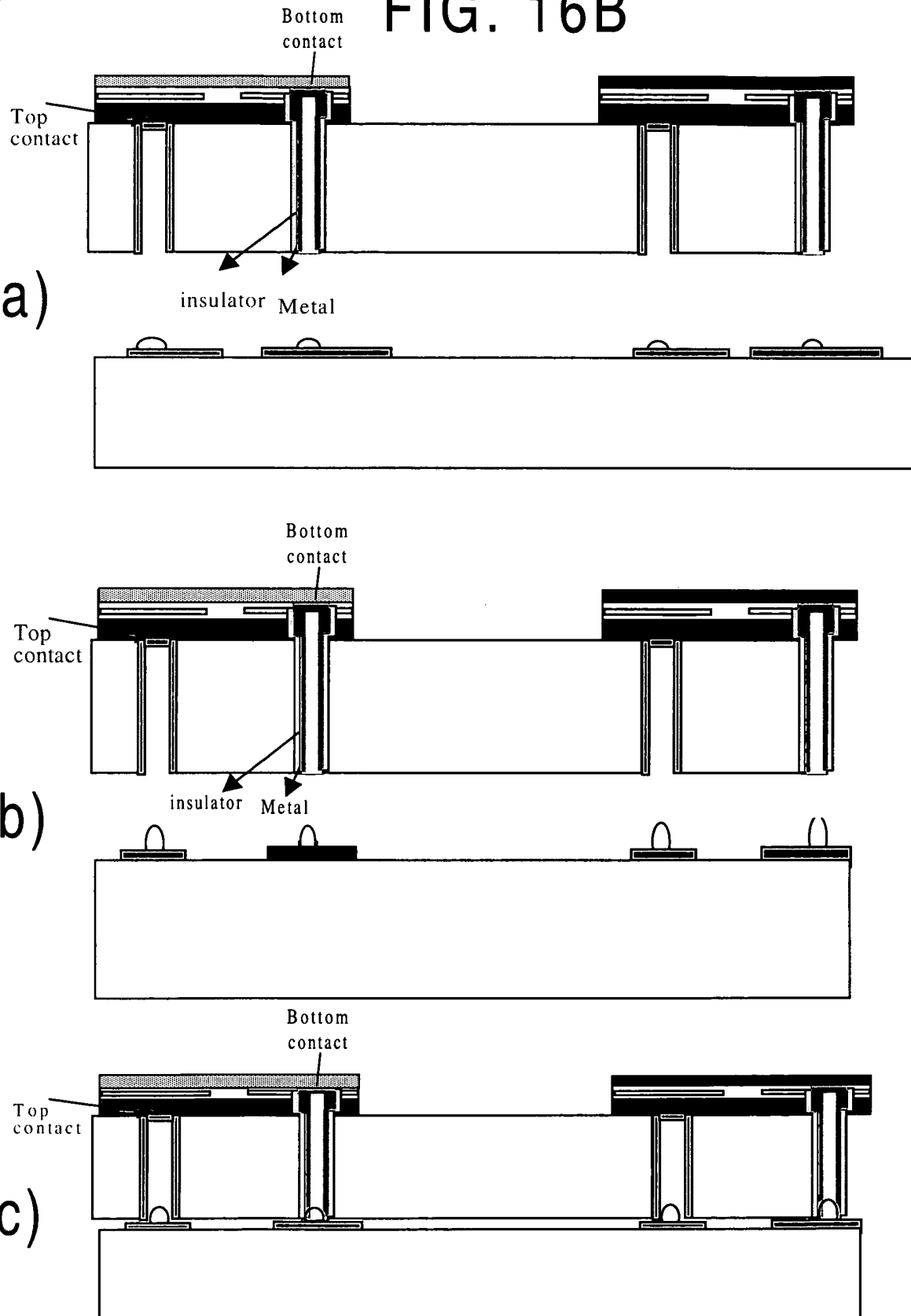




FIG. 17

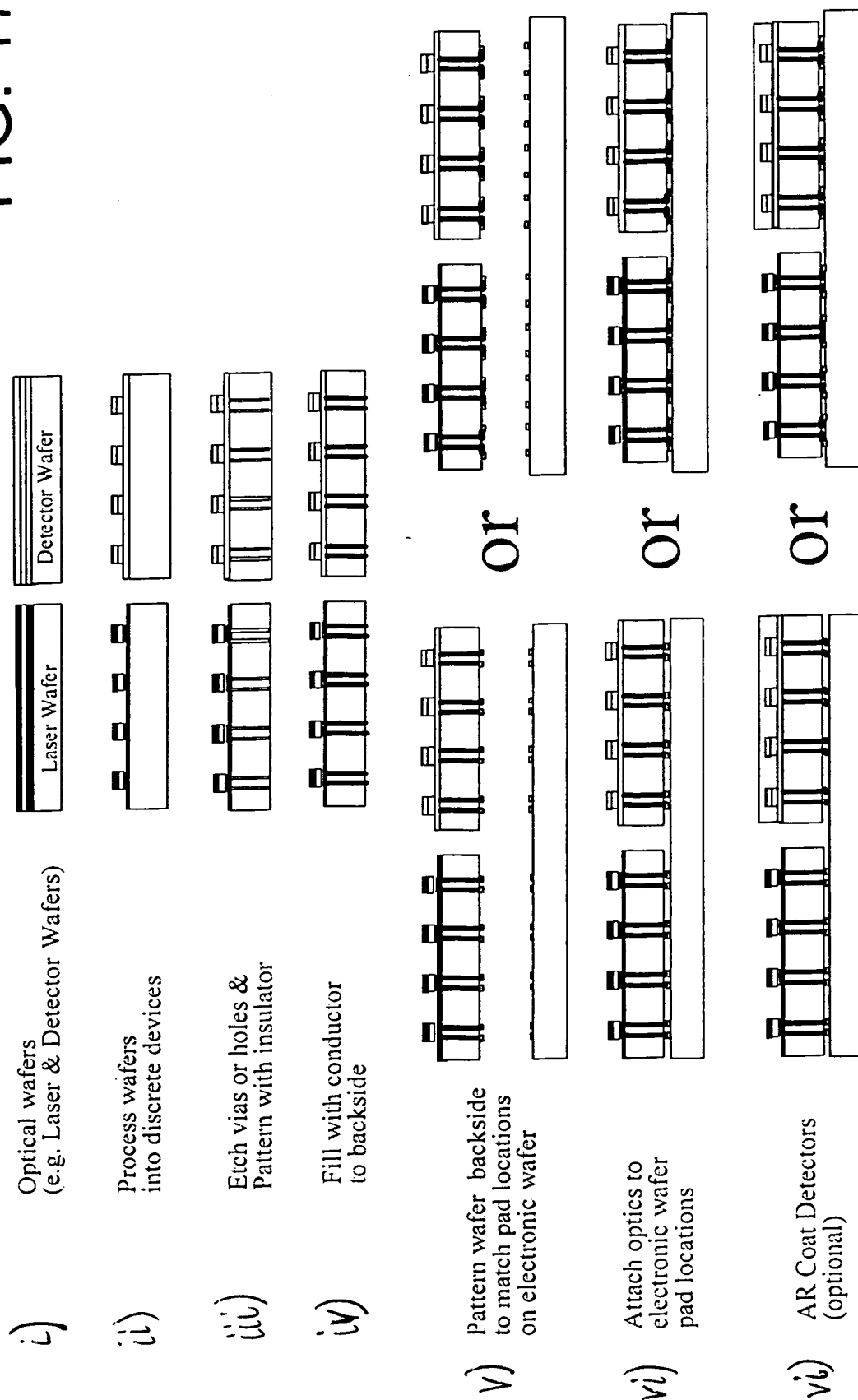
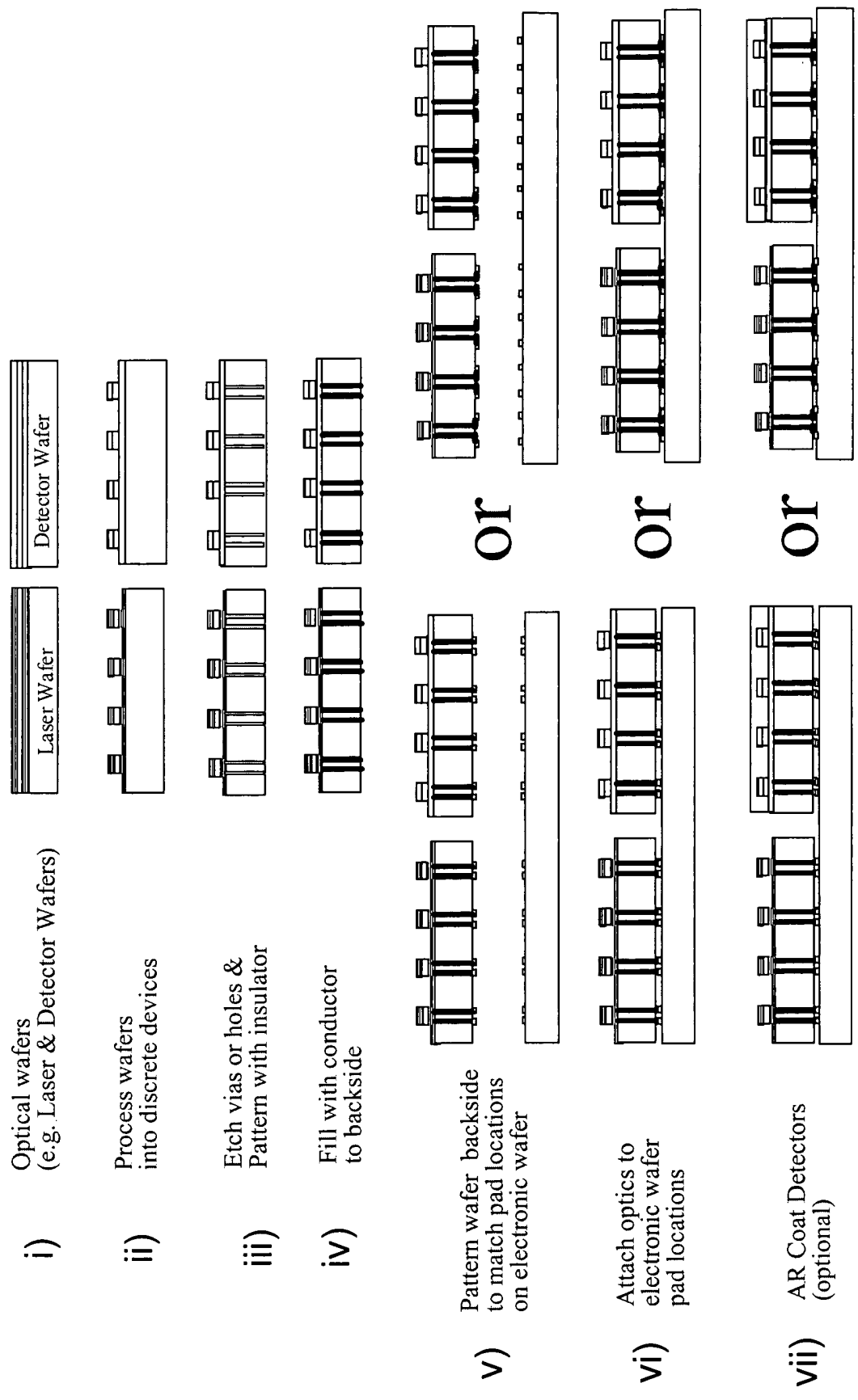


FIG. 17



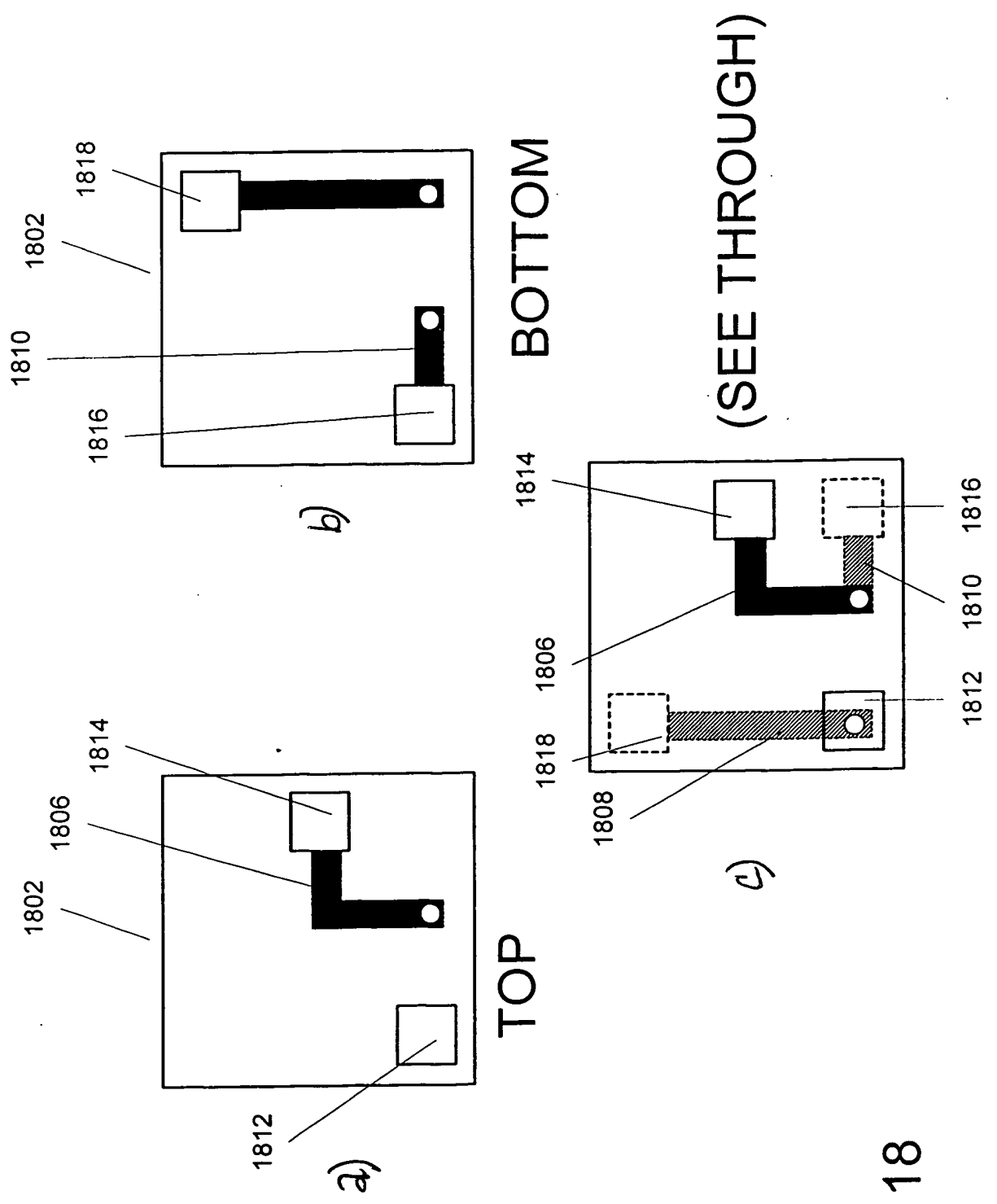


FIG. 18

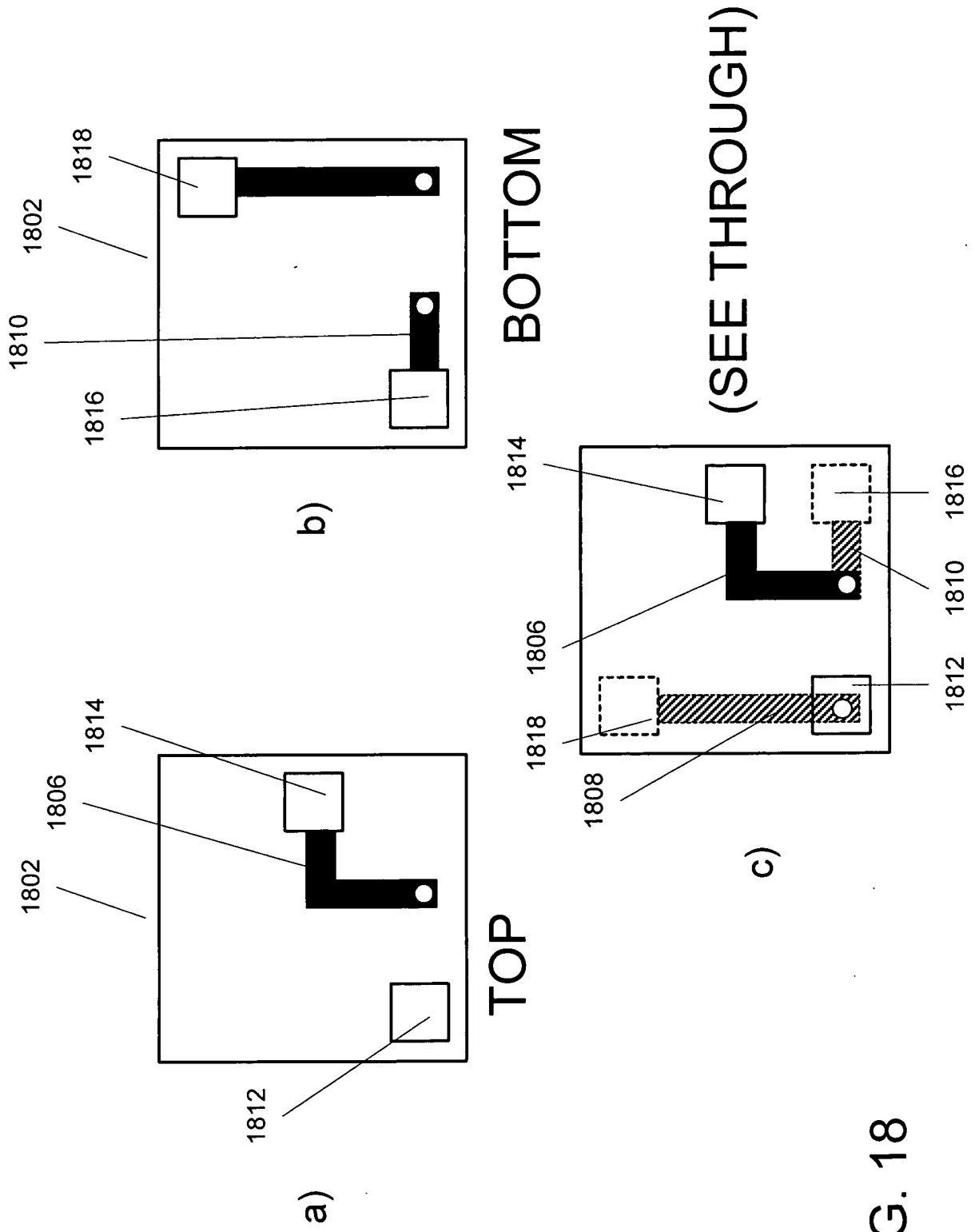
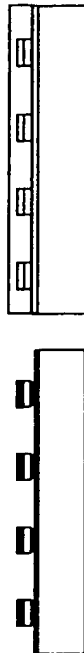


FIG. 18

i) Optical wafers  
(e.g Laser & Detector wafers)



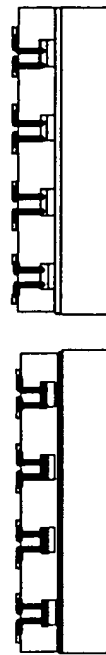
(ii) Process into individual devices  
& AR coat detectors



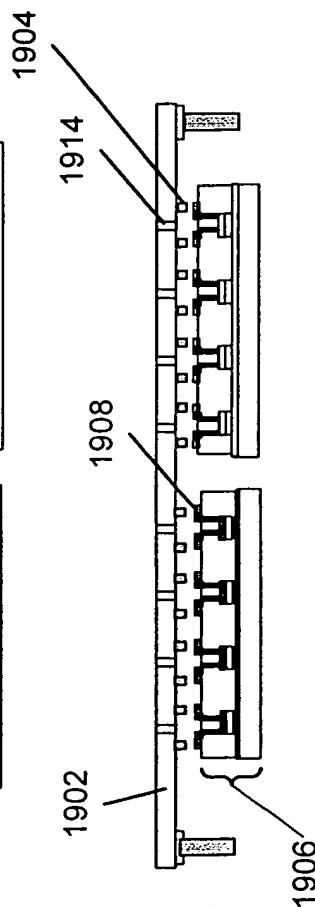
(iii) Cover devices with insulator and  
pattern vias through to device  
contact pads



(iv) Pattern optical device wafer  
to create traces to locations  
that will match mating  
contacts on adapter



v) Attach optical device chip  
to adapter via aligning  
pads created by patterning  
(NOTE: Holes in adapter can be  
created pre-post or concurrently  
with wafer patterning)



vi) Integrate adapter chip with  
electronic chip via standoff,  
wires, etc.

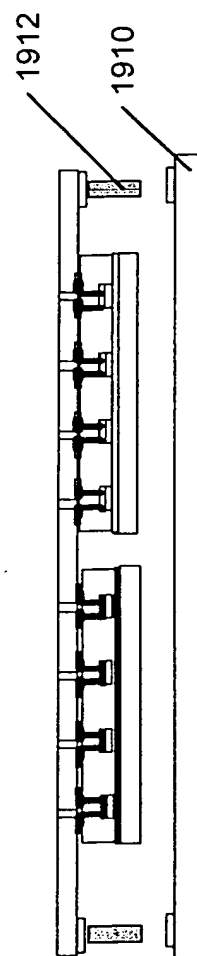
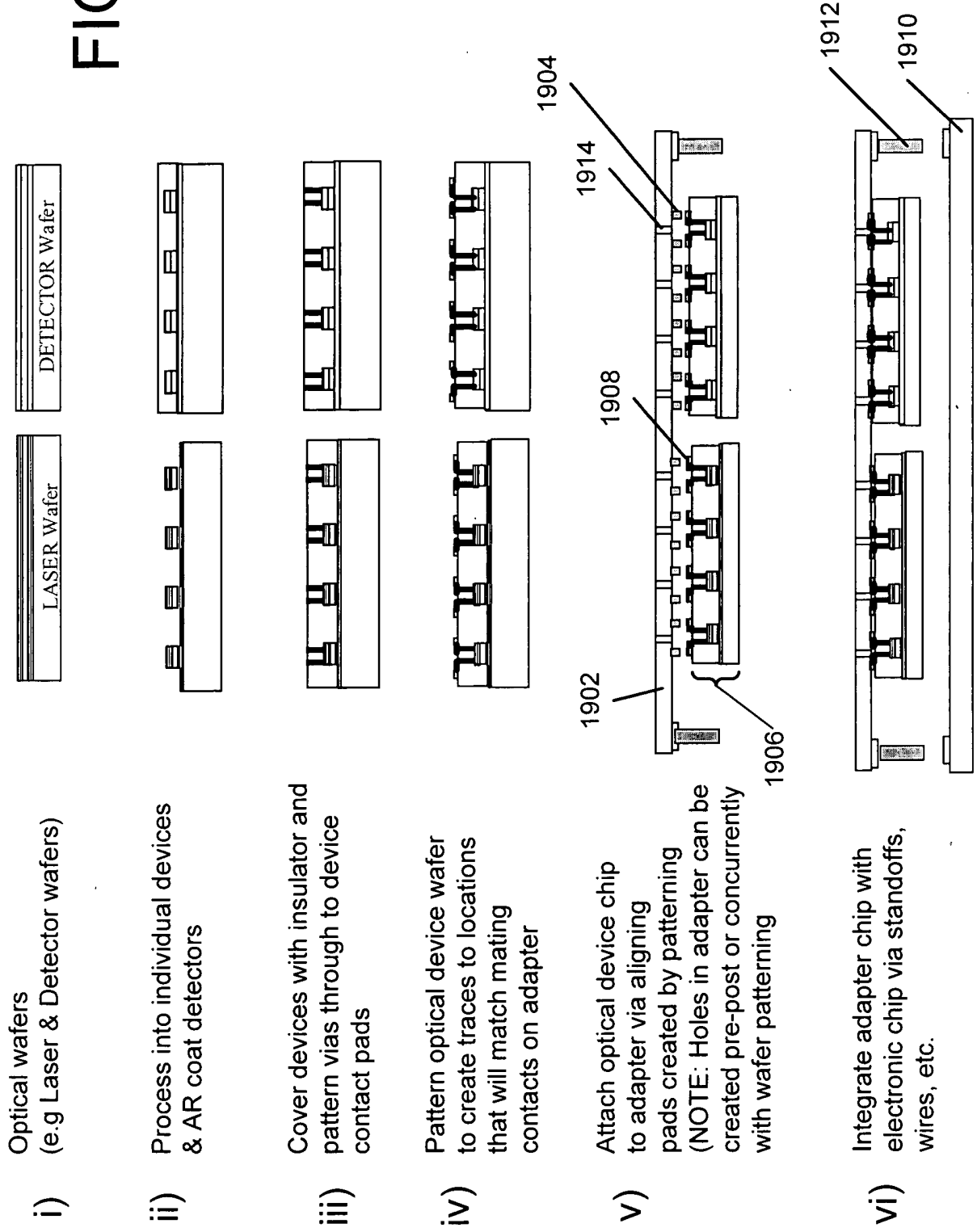


FIG. 19

FIG. 19



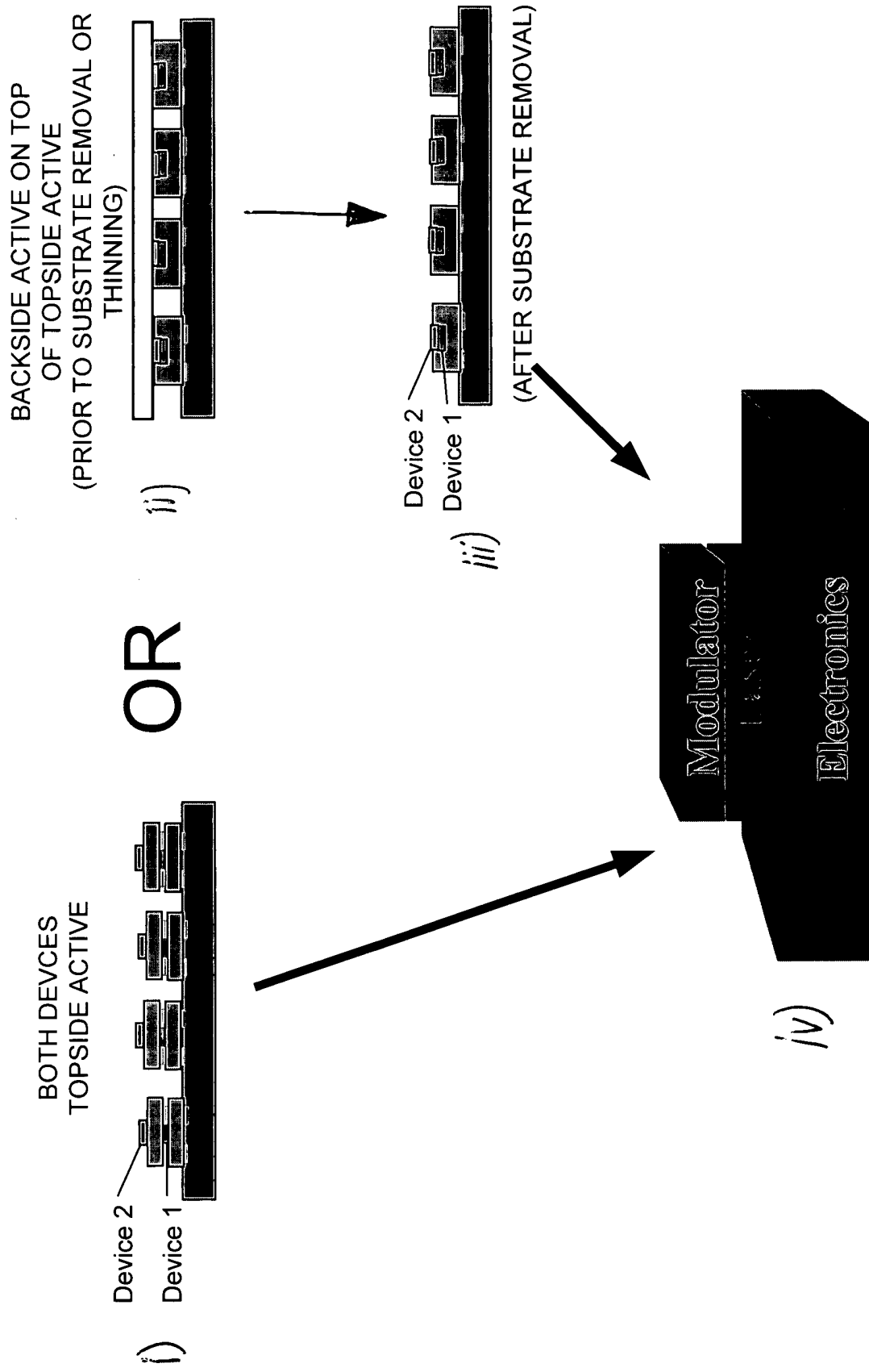


FIG. 20A

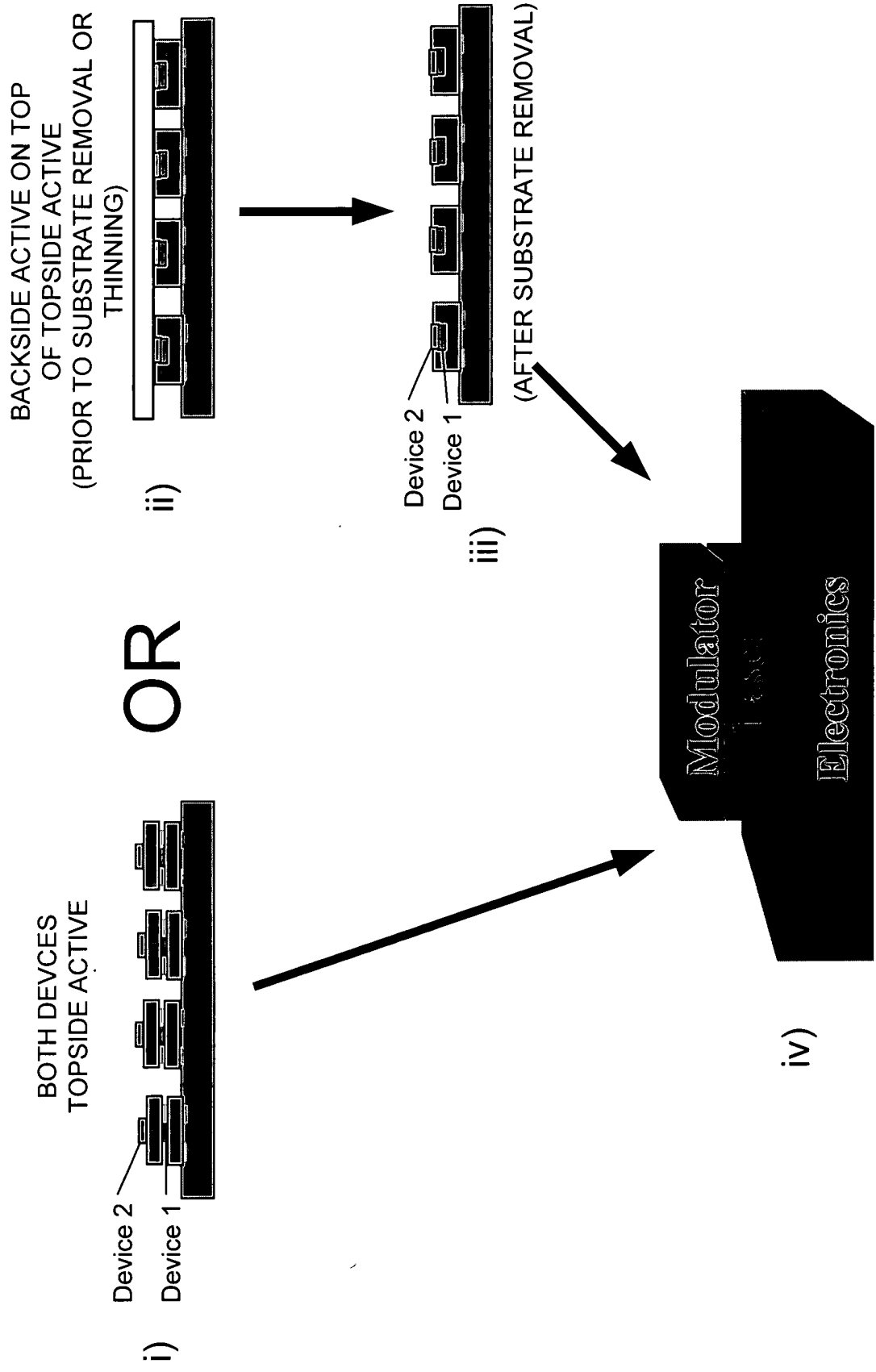


FIG. 20A



40 Gb/s = 20 GHz = 50ps  
Wavelength in free space =  $3 \times 10^{10}$  cm/s \*  $50^{12}$ s = 1.5cm  
1/8 wavelength in  $n=3$  = 640 microns

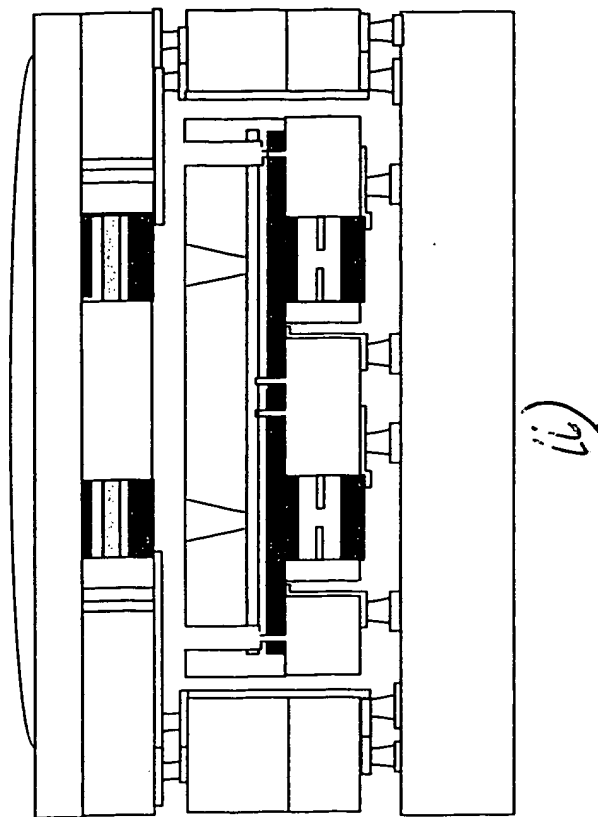
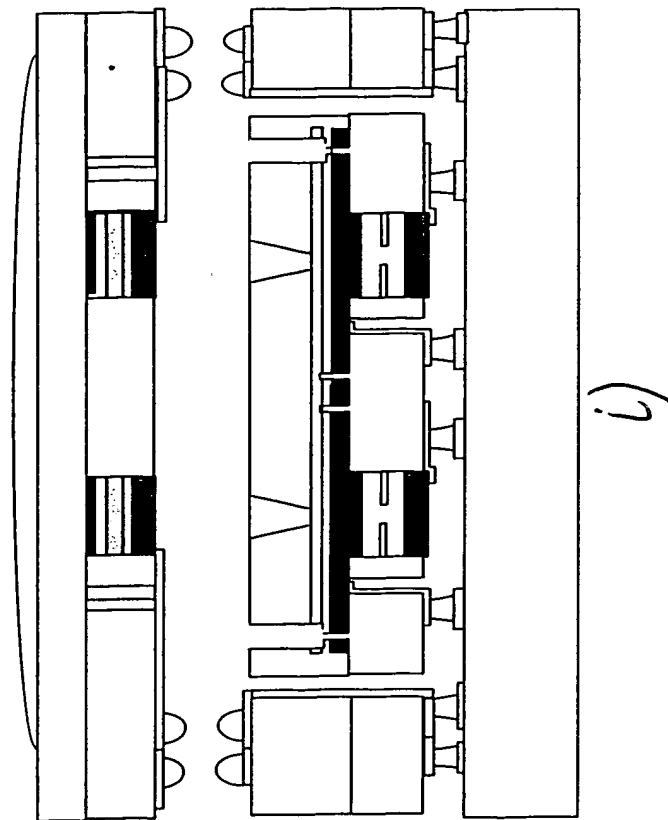
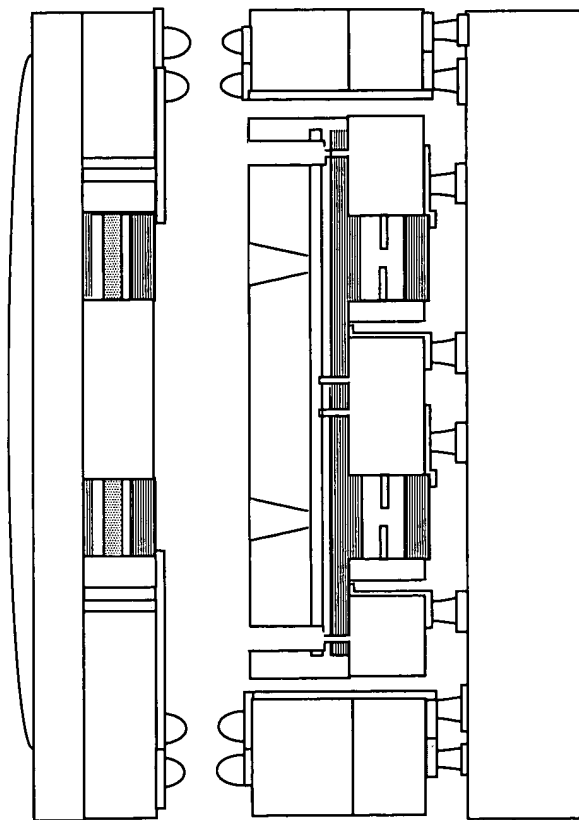
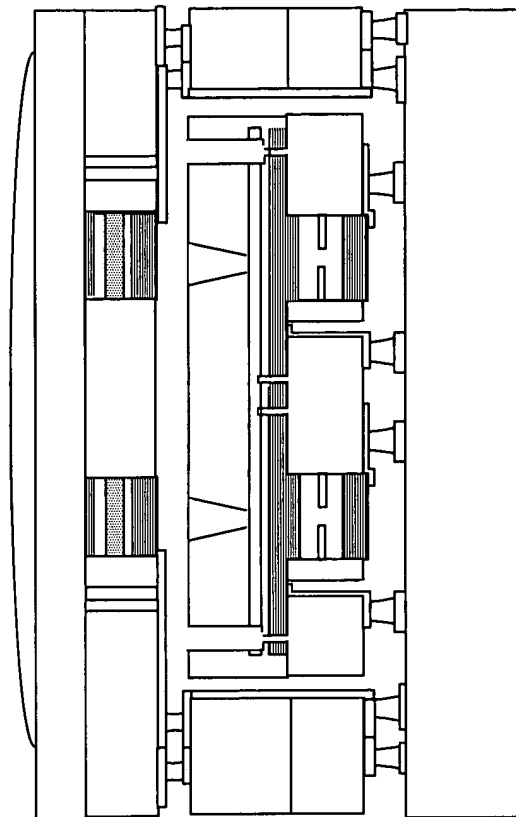


FIG. 20B

40 Gb/s = 20 GHz = 50ps  
 Wavelength in free space =  $3 \times 10^{10} \text{ cm/s} \times 50^{12} \text{ s} = 1.5 \text{ cm}$   
 1/8 wavelength in  $n=3 = 640 \text{ microns}$



i)



ii)

FIG. 20B

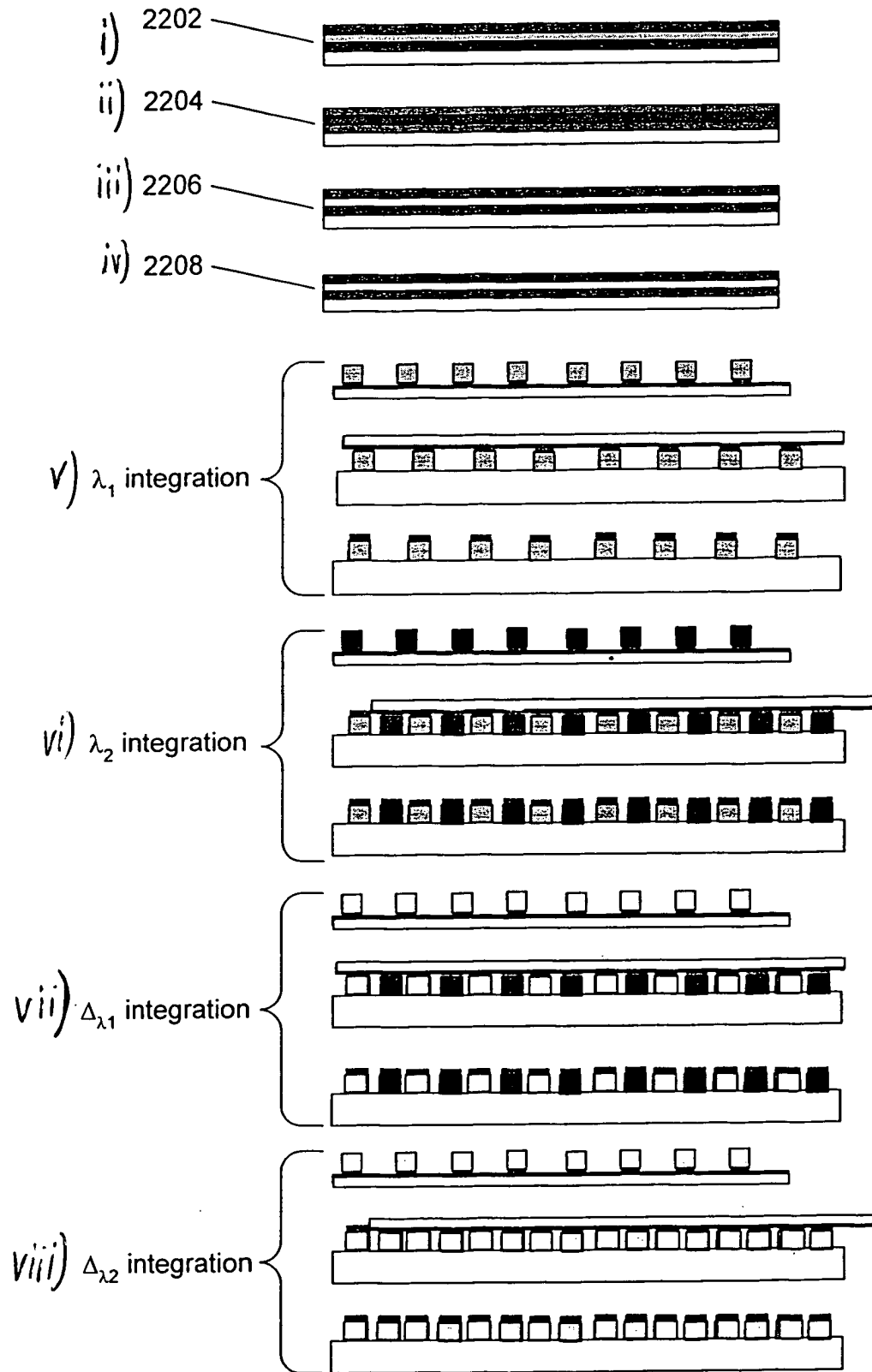


FIG. 22

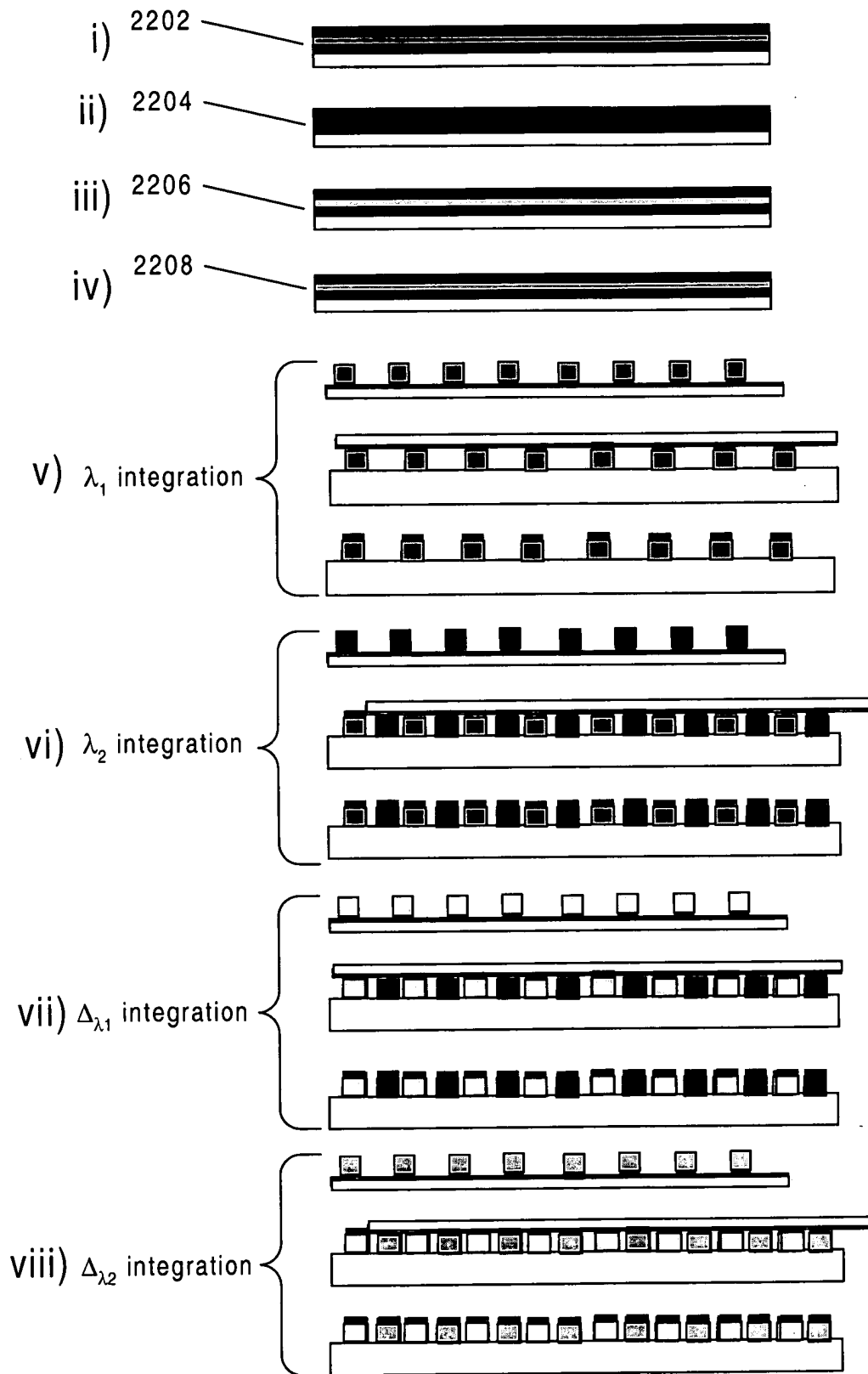
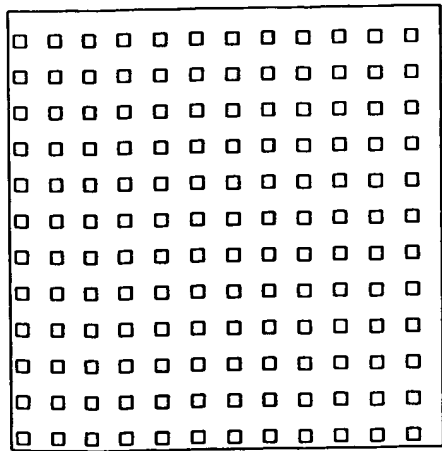
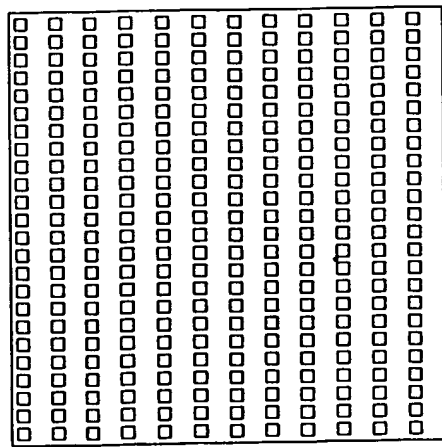


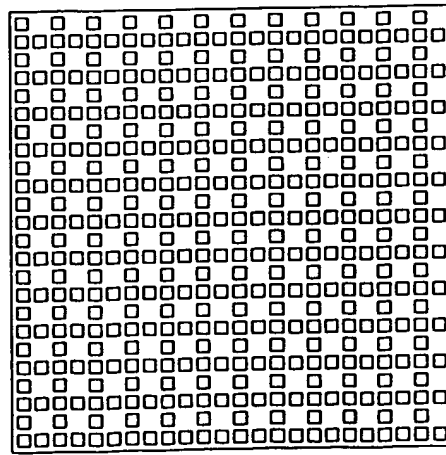
FIG. 22



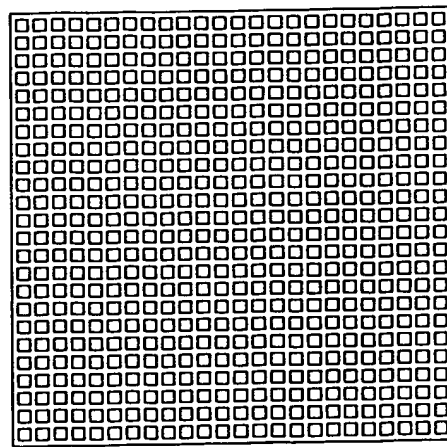
i)  $\lambda_1$  integration



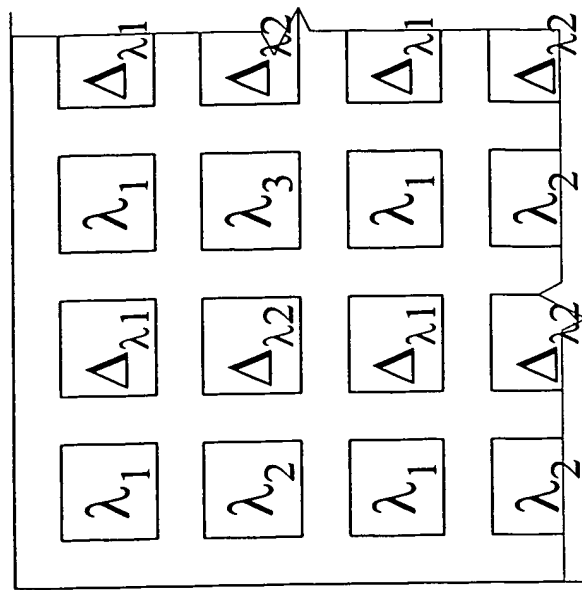
ii)  $\Delta_{\lambda_1}$  integration



iii)  $\lambda_2$  integration

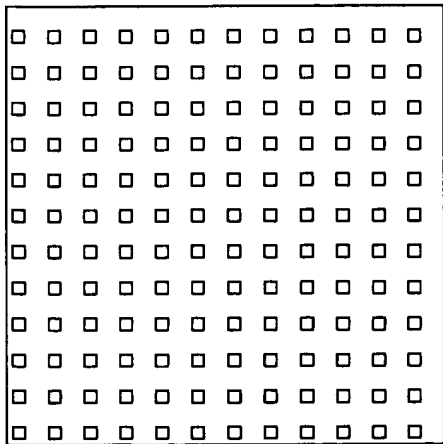


iv)  $\Delta_{\lambda_2}$  integration

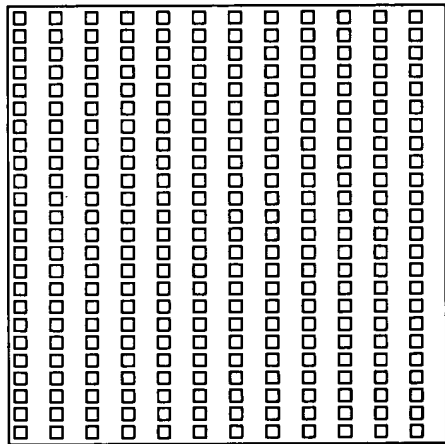


v)

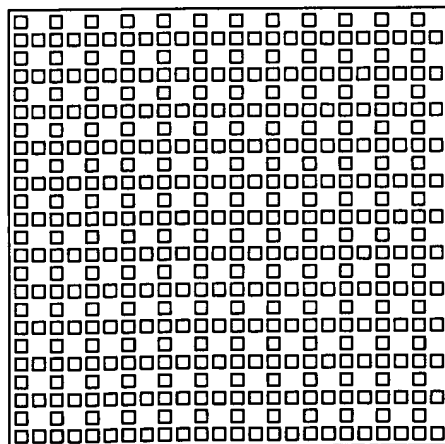
FIG. 23



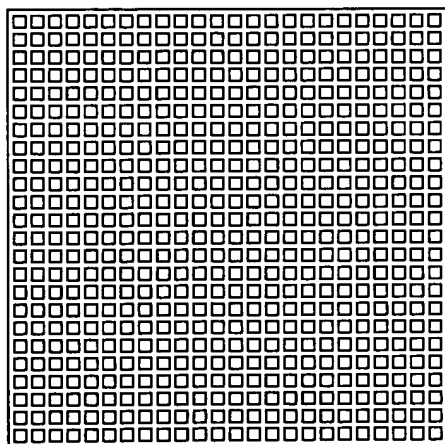
i)  $\lambda_1$  integration



ii)  $\Delta_{\lambda_1}$  integration



iii)  $\lambda_2$  integration



iv)  $\Delta_{\lambda_2}$  integration

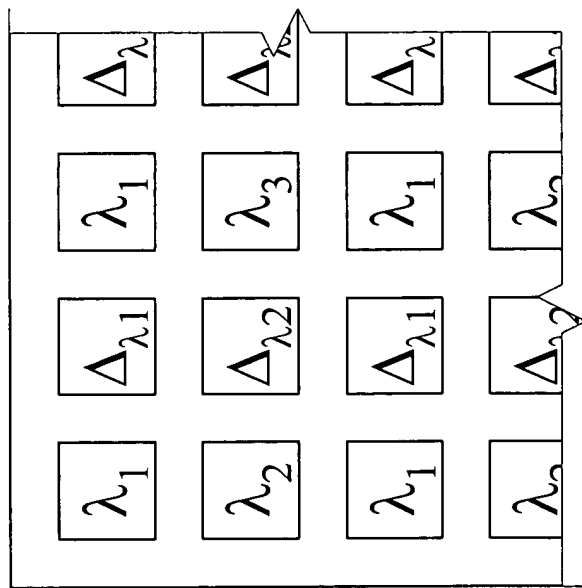


FIG. 23